



WATER RESOURCES RESEARCH GRANT PROPOSAL

Project ID: 2002MS3B

Title: Hydrologic Controls on Wetland Tree Growth: Determining the Origin, Residence Time and Water Quality of Groundwater in the Root Zone

Project Type: Research

Focus Categories: Wetlands, Groundwater, Ecology

Keywords: wetlands, surface-groundwater relationships, isotopes, plant-water relationships

Start Date: 03/01/2002

End Date: 02/28/2003

Federal Funds Requested: \$11,744

Non-Federal Matching Funds Requested: \$23,488

Congressional District: First

Principal Investigator:

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Abstract

Preservation of natural wetlands is a national priority, but there is still much to be learned concerning the impact of human activity on wetland systems. In areas of intensive agricultural production, nearby wetlands often serve as collection points for agricultural chemicals and sediments eroded from fields. Construction of roads and drainages alter the hydrologic regime in ways that can enhance or diminish the water supply in the wetland. The response of wetland organisms to these alterations are likely caused by multiple factors, not all of which may even be recognized. The end result is that the response of an organism to changes in wetland dynamics is often observed rather than understood. Effective management of natural wetlands requires an understanding of how changes in the wetland influence specific organisms.

The bald cypress (*Taxodium distichum*) is a dominant wetland tree species throughout the southeastern United States, and is prolific in the wetlands of Mississippi. The primary control on growth has often been linked to precipitation, but the link is poorly understood. Trees growing in continuously flooded soils still appear to respond to precipitation with higher rates of growth, which means precipitation may often be an indirect cause of growth. The true stimulus may be the flushing of nutrient-rich or oxidizing water through the root zone, or the delivery of nutrients via transported sediments during precipitation runoff events. Proactive management of bald cypress dominated wetlands requires a more thorough understanding of the hydrologic variables that potentially impact this population.